U2730-1

Louisiana Energy Indicators

Center for Energy Studies

Louisiana State University

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Iraqi Tank Diplomacy: Long Run Optimizing or Short Run Expediency

by

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and

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Iraq's demand for $25 oil, punctuated by the recent invasion of Kuwait, has certainly had a dramatic effect on world oil prices. Such higher prices should economically benefit noninvolved OPEC countries as well as Louisiana oil and gas producers.

This intuitively obvious conclusion is probably correct in the short run. However, the oil business is a long run operation. Over the longer term, economic analysis of world oil markets reveals that prices considerably below $25 would likely be economically best for members of OPEC.

To find this best price path we built a forty year optimization model that calculates prices and OPEC oil exports to the U.S. In the model the economically best price and export paths are the ones that maximize the net present value of total OPEC oil reserves (i.e. yield the greatest economic return to OPEC over the entire 40 year period). Since OPEC is assumed to be a monopoly, OPEC can pick its optimal prices and exports, whereas competitive U.S. producers have to take OPEC's choices as given. The paths for world price, OPEC exports to the U.S., and the corresponding U.S. production response are shown in Figures 1, 2, and 3. C1, our base case, is the case we consider most likely. Two other interesting cases are included. C2 is a pessimistic case with zero U.S. GNP growth instead of the base case rate of 2.5%. C3 assumes NonOPEC imports to the U.S. fall 10% per year rather than remaining a constant percent as in the base case.

Figure 1 shows the calculated price of oil for the forty year period 1987-2027. This price path, which is the best that OPEC can hope for economically, gives an import price for OPEC oil of $14.74 in 1987 rising to $17.64 by 1990. Hence, the best price in 1990 is considerably below the Iraqi $25 per barrel demand. Prices should then rise to $43.29 in 2027 for an increase of approximately 2.7% per year assuming no inflation.

(The rate of inflation would be added to the 2.7% base.)

Figure 1: Price of Crude Oil

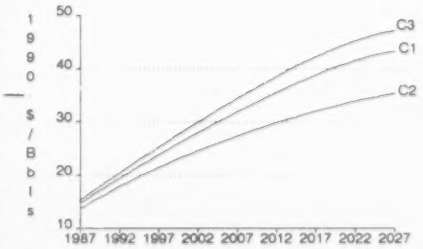

Figure 2 shows the OPEC exports to the U.S. that correspond to the simulated price path. Exports should gently fall at first. However, growing income stimulates demand making it more profitable to slightly increase exports later on. Lower income growth has a rather dramatic effect on OPEC exports to the U.S. (C2), but falling NonOPEC imports (C3) have little effect on OPEC's exports to the U.S.

Figure 2: US Oil Imports From Opec

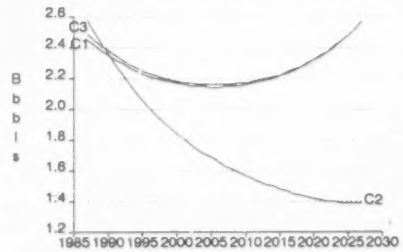

Figure 3 shows U.S. production corresponding to the price paths in Figure 1. U.S. production is the sum of the many individual U. S. producers each maximizing their own profits given the price path chosen by OPEC and their own costs and reserves. Their optimal path in the base case shows the same pattern as for OPEC exports to the U.S., gently falling then gently rising. Again we can see the depressing effect of the no growth assumption in C2. The C3 production results are rather more interesting. Although there was almost no change in OPEC imports, U.S. producers are left with a larger share of the market.

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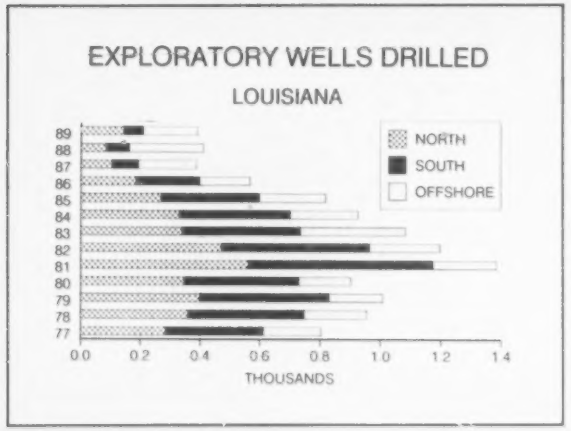
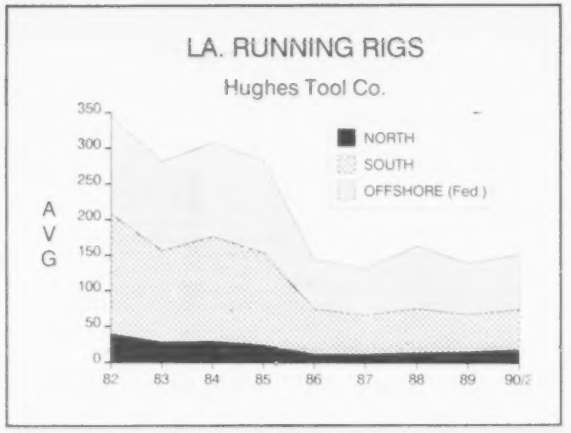
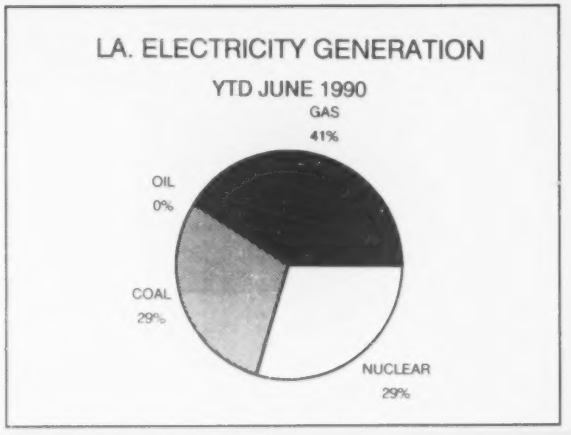
Drilling & Electric







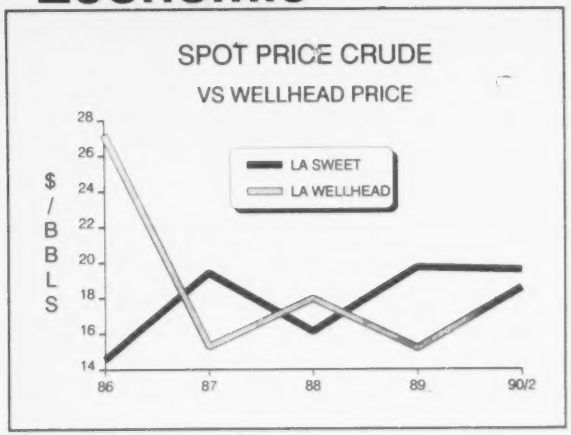
Figures represent TOTAL
except when otherwise noted

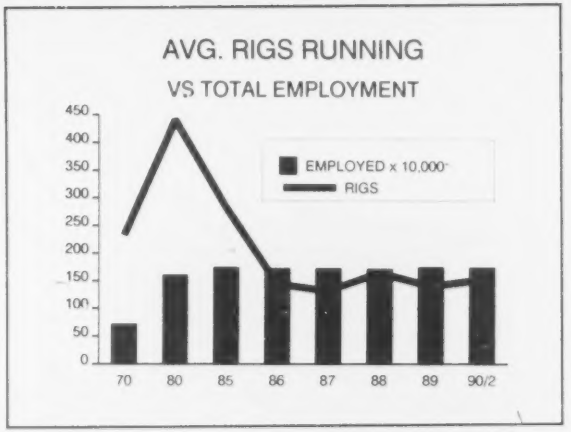
Totals may not add due to rounding

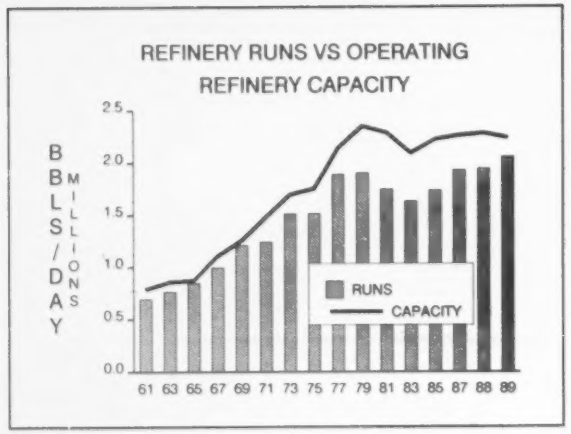
Indicator	1985	1986	1987	1988	1989	Jan	Feb	Mar	Apr	May	Jun	Year to Date Through Last Month Reported June 1989	Year to Date Through Last Month Reported June 1990	% Change
DRILLING PERMITS ISSUED														
Exploratory	599	298	283	249	204	7	14	15	17	18	16	95	87	-8.4%
Developmental	4811	1983	2169	1601	1486	93	66	117	125	139	136	640	678	5.9%
Total	5410	2281	2452	1850	1690	100	80	132	142	157	152	735	763	3.8%
RUNNING RIGS (Avg. Hughes Tool)														
North	25	12	12	14	16	21	17	20	16	16	20	15	18	20.0%
South	129	63	55	62	52	60	56	54	54	60	55	52	57	9.6%
Offshore (Includes Fed. OCS)	129	69	65	88	72	77	71	73	77	80	82	67	77	14.9%
EXPLORATORY WELLS - LA.*														
Oil	62	34	20	15	17	3	2	2	0	0	0	10	7	-30.0%
Gas	100	63	56	38	60	6	3	14	2	1	0	22	26	18.2%
Dry	665	423	350	376	312	28	20	39	49	20	20	162	176	8.6%
DEVELOPMENTAL WELLS - LA.* (As reported)	5290	3372	2029	2037	2172	350	379	494	123	128	128	1066	1602	50.3%
WELL COMPLETIONS - LA.* (As reported)														
North	4038	2209	1106	1018	862	99	65	126	53	65	70	417	478	14.6%
South	1325	1036	740	689	505	44	49	73	21	40	34	275	216	-21.5%
Offshore (Incl. fed. water)	754	628	598	759	1194	244	290	350	100	44	44	568	1072	88.7%
ELECTRICITY GENERATED (GWH)**														
Gas	27735	26035	23823	24286	21899	1098	1089	1642	1605	2080	3201	9874	10724	8.6%
Coal	13968	15587	15101	18429	18083	1404	1185	1509	1114	1106	1388	9267	7706	-16.8%
Oil	100	419	60	269	298	6	3	3	3	12	8	81	35	-56.8%
Nuclear Power	2458	10638	12324	13788	12391	1260	1127	1109	1338	1477	1413	5802	7724	33.1%
Total	44261	52679	51308	56770	52671	3767	3403	4264	4060	4676	6018	25023	26188	4.7%

*Source: Petroleum Information Corporation. CES maintains additional data in the Indicators Database.
**1GWH = 1 MILLION KWH

Economic







Figures represent TOTAL
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Totals may not add due to rounding

Indicator	1985	1986	1987	1988	1989	Jan	Feb	Mar	Apr	May	Jun	Year to Date Through Last Month Reported Varies 1989	Year to Date Through Last Month Reported Varies 1990	% Change
EMPLOYMENT (Thousands) - Avg.														
Oil & Gas Extraction (SIC13)	77.1	61.9	55.4	54.0	53.1	52.9	52.9	52.6	52.9	52.7	53.2	52.5	52.9	0.8%
Chemicals & Allied Products (SIC28)	28.0	26.1	25.3	26.8	28.1	28.4	28.4	28.4	28.4	28.6	28.8	28.0	28.5	1.8%
Petroleum Refining (SIC29)	11.1	11.5	11.5	10.3	10.5	10.6	10.7	10.7	10.7	10.6	10.9	10.6	10.7	0.9%
Total La. Employment	1744.2	1727.3	1726.7	1712.0	1747.6	1702.9	1705.9	1723.4	1752.5	1770.5	1787.2	1718.5	1740.4	1.3%
OIL PRICES ($/BBL) - Avg.														
Wellhead														
LA	27.22	15.29	17.97	15.18	18.34	21.24	21.00	19.48	17.30	16.88	15.45	18.20	18.56	2.0%
US	24.09	12.45	15.42	12.55	15.86	18.50	18.18	16.58	14.52	13.82	12.79	15.64	15.73	0.6%
SPOT (Avg. End of Week)														
W. Texas Int. - Cushing	NC	14.47	18.80	15.96	19.58	22.62	22.12	20.42	18.79	18.32	16.87	19.36	19.86	2.6%
Louisiana - St. James	NC	14.56	19.42	16.12	19.71	22.97	21.63	20.01	18.29	17.94	16.59	19.59	19.57	-0.1%
COAL-LIGNITE PRODUCTION (Thousand Short Tons)	NC	2254	2774	2892	2976	245	157	246	318	314	225	1341	1495	11.5%
REFINERY RUNS (Avg.Mbbls/day)	1736.5	1901.5	1931.4	1945.3	2059.6	1869.6	1996.3	1890.9	1977.7	2098.2	NA	2118.6	NA	NA

NC = Not Collected

Miscellaneous

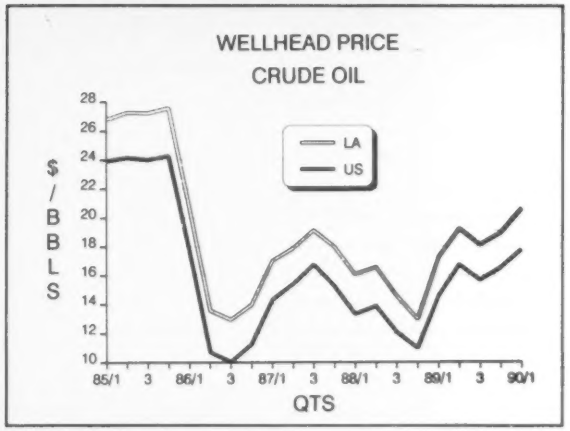
Due to our inability to obtain data in a timely fashion from the reporting sources, we have had to restructure the tables in this publication. All older and less timely data are now grouped in this panel as *Miscellaneous*.

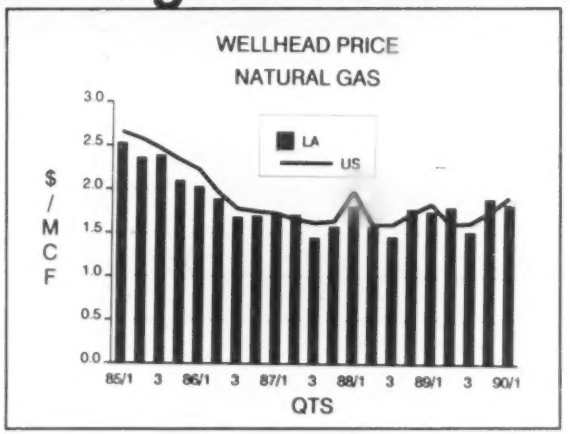
Figures represent TOTAL except when otherwise noted

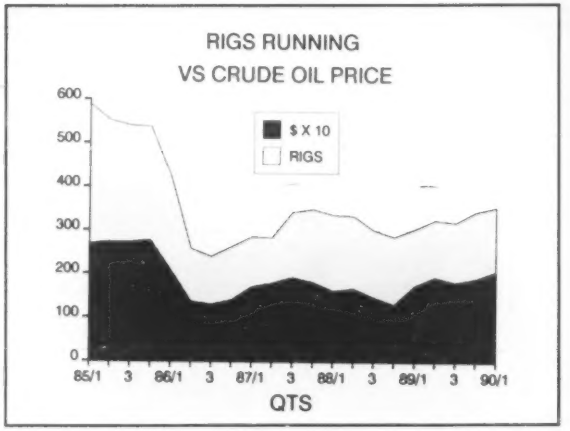
Totals may not add due to rounding

Indicator	1985	1986	1987	1988	1989	Jan	Feb	Mar	Apr	May	Jun	Year to Date Through Last Month Reported Varies 1989	Year to Date Through Last Month Reported Varies 1990	% Change
CRUDE OIL PRODUCING WELLS														
North	18792	19346	18630	17953	16849	16582	16821	17221	17455	NA	NA	17077	17020	-0.3%
South	6278	6117	5897	5711	5467	5280	5281	5279	5249	NA	NA	5613	5272	-6.1%
Offshore	996	1000	963	969	925	908	913	927	927	NA	NA	936	919	-1.8%
Total	26066	26463	25490	24633	23241	22770	23015	23427	23618	NA	NA	23626	23208	-1.8%
NATURAL GAS PRODUCING WELLS														
North	11026	11049	10726	10813	10861	10958	10792	10876	10667	NA	NA	11006	10823	-1.7%
South	2976	2698	2670	2539	2474	2459	2469	2477	2415	NA	NA	2515	2455	-2.4%
Offshore	511	438	413	445	501	519	518	519	514	NA	NA	481	518	7.6%
Total	14513	14185	13809	13796	13836	13936	13779	13872	13596	NA	NA	14002	13796	-1.5%
CRUDE OIL PRODUCTION - Lease Condensate Included (Avg. MBBLS/day)														
North	87.6	80.5	76.7	73.6	69.5	74.2	73.0	72.5	68.7	NA	NA	70.0	72.1	3.0%
South	350.2	345.9	328.0	311.0	288.0	276.6	279.3	274.5	270.6	NA	NA	298.7	275.3	-7.9%
Offshore	70.0	71.4	66.6	67.2	62.1	57.2	61.8	59.9	63.6	NA	NA	63.2	60.6	-4.1%
Total	507.8	497.8	471.3	451.9	419.6	408.0	414.1	406.8	402.9	NA	NA	431.9	408.0	-5.5%
NATURAL GAS PRODUCTION - Casinghead Included (Avg. MMCF/day)														
North	0.96	0.99	0.98	1.00	1.00	1.10	1.10	1.10	1.06	NA	NA	1.07	1.08	0.9%
South	3.48	3.30	3.20	3.20	3.10	3.10	3.20	3.10	2.99	NA	NA	3.24	3.10	-4.3%
Offshore	0.70	0.68	0.62	0.60	0.60	0.59	0.59	0.58	0.54	NA	NA	0.54	0.57	5.6%
Total	5.13	4.97	4.80	4.80	4.70	4.80	4.80	4.80	4.59	NA	NA	4.85	4.75	-2.1%
GAS PRICES ($/MCF)-Avg. Wellhead														
LA	2.34	1.83	1.62	1.67	1.74	2.39	1.78	1.36	NA	NA	NA	1.75	1.84	5.1%
US	2.51	1.94	1.66	1.73	1.71	2.23	1.87	1.67	1.56	1.53	NA	1.73	1.75	1.2%
PRINCIPAL ENERGY RELATED REVENUES (Millions $)														
Sev. - Oil & Condensate	598.3	390.3	345.6	300.0	314.4	20.4	36.9	28.5	27.6	25.7	16.2	158.5	155.2	-2.1%
Sev. - Natural Gas	121.1	126.1	112.7	106.4	109.4	9.4	9.7	9.0	9.2	9.2	6.5	58.6	53.1	-9.4%
Bonuses	32.1	15.9	25.5	17.7	12.1	1.3	2.7	0.1	NA	NA	NA	6.5	NA	NA
Rentals	20.9	12.3	6.7	9.3	8.5	0.5	0.7	1.1	NA	NA	NA	3.5	NA	NA
Royalties	379.1	304.5	253.8	243.2	275.8	18.3	18.6	21.7	NA	NA	NA	111.5	NA	NA
Special Fuels Tax	52.3	57.6	55.2	58.0	58.5	5.2	5.5	4.8	6.9	6.2	5.7	28.6	34.3	19.9%
Gasoline Tax	286.2	289.5	311.6	314.7	208.0	26.6	29.5	30.1	32.4	31.4	27.0	156.2	177.0	13.3%
Nat. Gas Franchise Tax	11.0	10.9	9.3	9.7	9.0	0.2	1.6	0.1	0.1	2.9	0.6	4.9	5.5	12.2%
Total Energy Revenues	1502.9	1211.6	1126.4	1062.8	1100.8	82.7	105.4	95.6	NA	NA	NA	530.4	NA	NA
TOTAL STATE REVENUES (Millions $)	4335.6	3913.2	3783.6	4181.8	4457.9	389.0	NA	NA	NA	NA	NA	2295.4	NA	NA
ENERGY RELATED REVENUES AS % OF STATE TOTAL	34.7	31.0	29.8	25.4	24.7	21.3	NA	NA	NA	NA	NA	23.1	NA	NA

Historical Presentation - Rigs & Prices







Figures represent TOTAL
except when otherwise noted

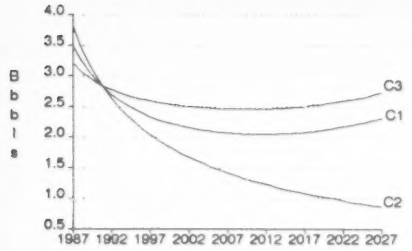
Totals may not add due to rounding

Indicator	84.2	84.3	84.4	85.1	85.2	85.3	85.4	86.1	86.2	86.3	86.4	87.1
RUNNING RIGS (Avg. Hughes Tool)												
North	30	30	29	32	25	26	16	17	7	12	11	12
South	136	137	159	147	126	121	122	96	55	47	52	53
Offshore (Includes Fed. OCS)	120	128	148	141	129	122	125	107	60	51	59	51
Total - LA	286	294	336	320	280	269	263	219	122	110	122	115
Total - US	2253	2408	2611	2198	1867	1923	1914	1464	797	724	894	830
OIL PRICES ($/BBLS) - Avg.												
Wellhead												
LA	29.91	29.84	28.58	26.81	27.26	27.23	27.57	20.71	13.57	12.93	13.95	16.98
US	26.01	26.03	25.47	23.93	24.15	24.00	24.29	17.80	10.70	10.04	11.26	14.31
GAS PRICES ($/MCF) - Avg.												
Wellhead												
LA	2.41	2.49	2.87	2.53	2.36	2.39	2.10	2.03	1.89	1.68	1.70	1.73
US	2.67	2.66	2.60	2.66	2.58	2.47	2.34	2.23	1.97	1.78	1.75	1.73

Indicator	87.2	87.3	87.4	88.1	88.2	88.3	88.4	89.1	89.2	89.3	89.4	90.1
RUNNING RIGS (Avg. Hughes Tool)												
North	8	14	13	11	13	16	16	13	16	16	20	19
South	47	63	73	74	65	54	54	50	53	47	58	57
Offshore (Includes Fed. OCS)	51	74	83	90	90	85	86	69	64	76	77	74
Total - LA	105	151	169	176	168	155	156	132	133	138	155	149
Total - US	768	1002	1146	1001	902	923	922	785	773	891	1030	938
OIL PRICES ($/BBLS) - Avg.												
Wellhead												
LA	17.86	19.10	17.95	16.06	16.55	14.55	12.95	17.20	19.19	18.08	18.91	20.57
US	15.40	16.73	15.23	13.33	13.86	12.06	10.96	14.55	16.72	15.64	16.51	17.75
GAS PRICES ($/MCF) - Avg.												
Wellhead												
LA	1.71	1.45	1.58	1.81	1.58	1.46	1.78	1.75	1.80	1.52	1.90	1.84
US	1.66	1.62	1.64	1.98	1.60	1.60	1.73	1.84	1.61	1.62	1.75	1.92

Continued from front

Figure 3: US Oil Production



These price and production patterns have implications for import costs and revenues. Under all scenarios the import bill from OPEC, and hence OPEC revenues, would rise in real terms: 2.8% per year in the base case, .8% with no income growth, and 2.9% in the declining NonOPEC imports case. Dependence on OPEC would increase as lower cost OPEC production would increase faster than higher cost U.S. production. In both C1 and C2, OPEC imports would surpass U.S. production by the end of the simulation period.

U.S. producers do not do as well as OPEC. Under the base case total revenues rise about 1.7% per year. If Louisiana is able to maintain a constant share of U.S. production (14%), her revenues would go up by the same percent. If Non-OPEC imports fall, Louisiana producers could do even better with a growth in revenues of 2.4% per year. However, they would still not match the 2.9% growth in OPEC revenues. In the no growth case, Louisiana would fare rather badly. For although OPEC with monopoly power has small but positive growth in revenues, Louisiana sees her total oil revenues fall about 1.3% per year.

These simulations suggest that the economically best price for OPEC is below those currently prevailing. With resolution of the crisis, there should be economic pressure for long run price trends to return to pre-crisis levels.2 But one may argue that OPEC is not a perfect monopolist, nor does OPEC have a forty year planning horizon. However, relaxing these extreme assumptions only strengthens the argument. If OPEC producers competed with one another or if they maximized profits for only one period at a time, then the simulated best price paths would be even lower. Hence, we can conclude that, oil prices before the invasion were economically better for OPEC than the recent Iraqi demands for $25 oil. The lower simulated prices support the contention that these demands are a short term expediency that are not likely to be in OPEC's nor even in Iraq's long term economic interest.

*The views expressed are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of Dallas or the Federal Reserve System.

Model Assumptions: In the base case OPEC total proven reserves are 769,214 million barrels. U.S. total reserves are 100,700 million barrels. This U.S. number, which includes an allowance for future oil to be found, is derived from U.S. Bureau of the Mines estimates. U.S. operating costs are computed to start at $5.15. Operating plus development costs by 2027 rise to $43.29 per barrel. OPEC operating plus transportation costs to the U.S. are computed to be $3.59 in 1987. Operating plus development plus transportation to the U.S. by 2027 are $21.68 per barrel. U.S. GNP is assumed to grow by 2.5 percent per year over the entire simulation period, real interest rates are 8%, Non-OPEC imports to the U.S. remain constant at the 1987 level and product imports are a constant percent of demand. Oil product taxes are assumed to remain the same proportion of crude oil prices. OPEC exports to the rest of the world are assumed to follow the same pattern as those to the U.S. For a more complete description of the optimization problem, model inputs, sensitivity testing, and policy analysis see Ycel and Dahl (1990).

Sensitivity analysis over a wider range of other scenarios in Ycel and Dahl (1990) also supports these conclusion.

Ycel, Mine and Dahl, Carol (1990) "A Dynamic Comparison of an Oil Import Fee, a Gasoline Tax, and a Domestic Producer Subsidy," manuscript Federal Reserve Bank of Dallas and Department of Economics, Louisiana State University.

Bbbls = billions of barrels

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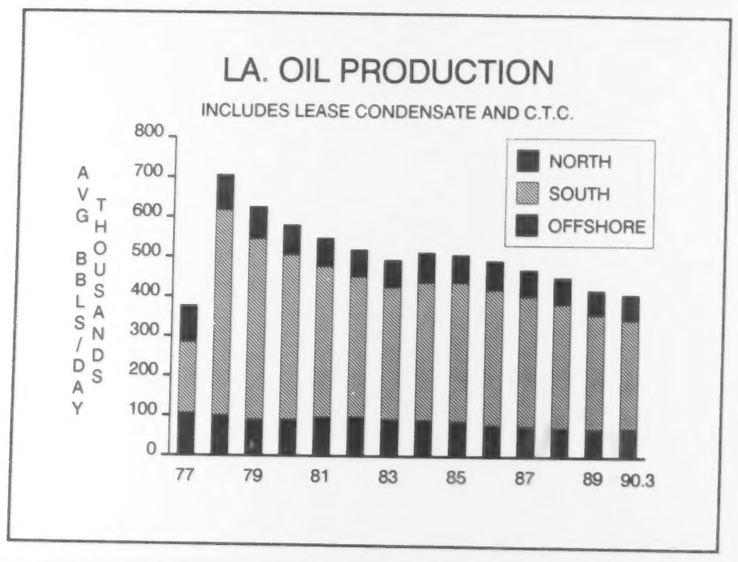
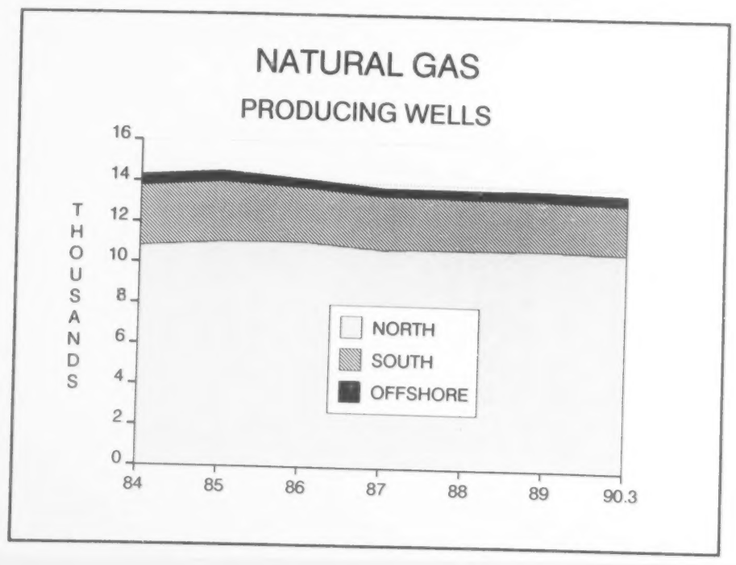
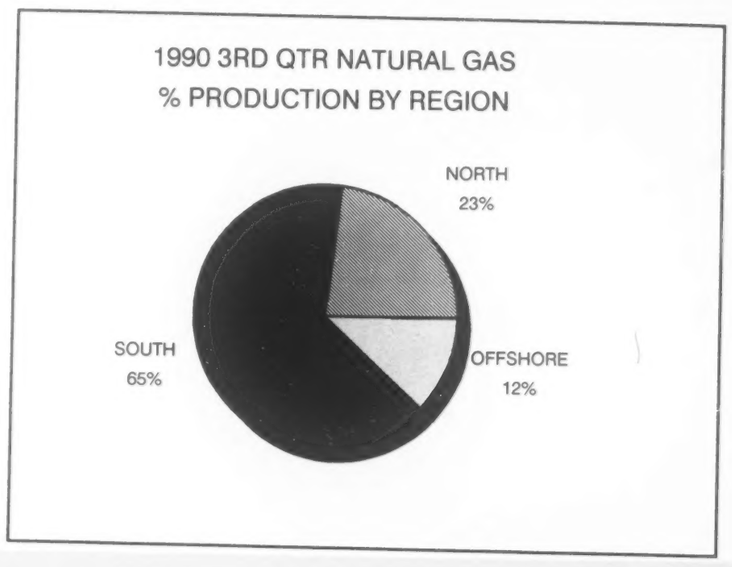
Address Correction Requested

Production

Due to our inability to obtain data in a timely fashion from the reporting sources, this table varies in structure from the others in this publication.





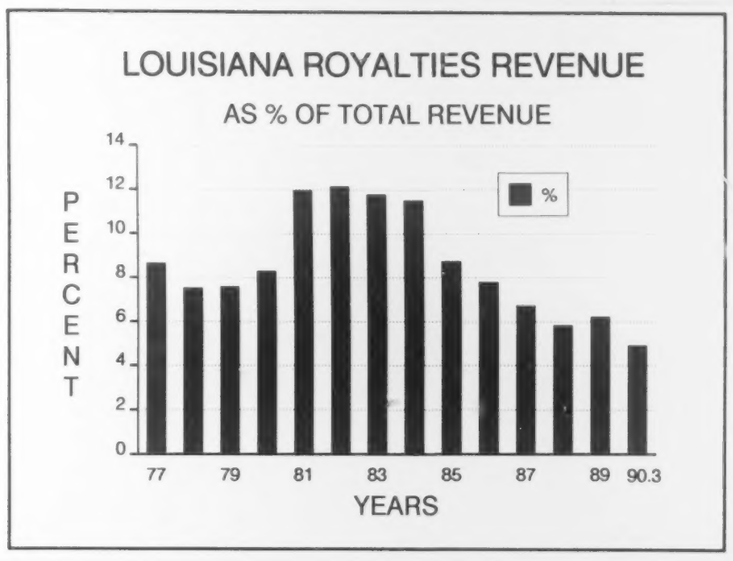


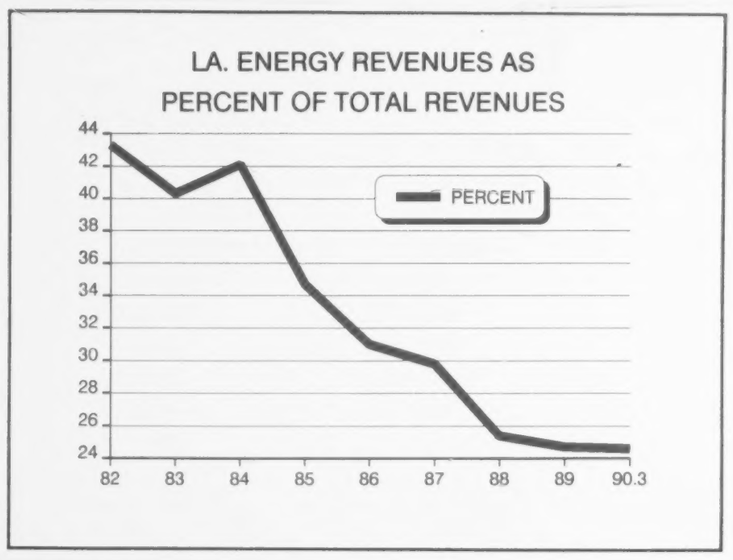
Figures represent TOTAL
except when otherwise noted

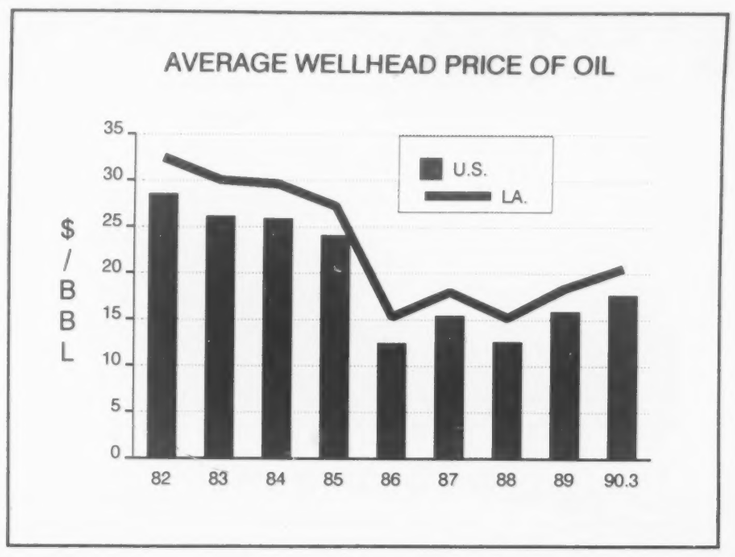
Totals may not add due to rounding

Indicator	1986	1987	1988	1989	90.1	Apr	May	Jun	Jul	Aug	Sep	Year to Date Through Last Month Reported Varies 1989	Year to Date Through Last Month Reported Varies 1990	% Change
CRUDE OIL PRODUCING WELLS														
North	19346	18630	17953	16849	16875	17455	17137	17698	NA	NA	NA	17009	17152	0.8%
South	6117	5897	5711	5467	5280	5249	5326	5209	NA	NA	NA	5556	5271	-5.1%
Offshore	1000	963	969	925	916	914	905	905	NA	NA	NA	934	912	-2.4%
Total	26463	25490	24633	23241	23071	23618	23368	23812	NA	NA	NA	23499	23335	-0.7%
NATURAL GAS PRODUCING WELLS														
North	11049	10726	10813	10861	10875	10667	10723	10699	NA	NA	NA	10956	10788	-1.5%
South	2698	2670	2539	2474	2468	2415	2418	2320	NA	NA	NA	2508	2426	-3.3%
Offshore	438	413	445	501	519	514	510	511	NA	NA	NA	487	515	5.7%
Total	14185	13809	13796	13836	13862	13596	13661	13530	NA	NA	NA	13950	13729	-1.6%
CRUDE OIL PRODUCTION - Lease Condensate Included (Avg. MBBLS/day)														
North	80.5	76.7	73.6	69.5	73.2	68.7	72.1	70.8	NA	NA	NA	69.4	71.8	3.5%
South	345.9	328.0	311.0	288.0	276.8	270.6	273.7	267.5	NA	NA	NA	297.3	273.7	-7.9%
Offshore	71.4	66.6	67.2	62.1	59.6	63.6	60.3	62.4	NA	NA	NA	63.8	60.9	-4.5%
Total	497.8	471.3	451.9	419.6	409.6	402.9	405.0	401.8	NA	NA	NA	430.5	406.4	-5.6%
NATURAL GAS PRODUCTION - Casinghead Included (Avg. MMCF/day)														
North	0.99	0.98	1.00	1.00	1.09	1.06	1.06	1.10	NA	NA	NA	1.07	1.08	0.9%
South	3.30	3.20	3.20	3.10	3.14	2.99	2.95	2.97	NA	NA	NA	3.24	3.05	-5.9%
Offshore	0.68	0.62	0.60	0.60	0.59	0.54	0.54	0.52	NA	NA	NA	0.54	0.56	3.7%
Total	4.97	4.80	4.80	4.70	4.82	4.59	4.55	4.59	NA	NA	NA	4.85	4.70	-3.1%

Employment, Prices & Revenue







Figures represent TOTAL
except when otherwise noted

Totals may not add due to rounding

Indicator	1985	1986	1987	1988	1989	89.4	90.1	90.2	Jul	Aug	Sep	Year to Date Through Last Month Reported Sep 1989	Year to Date Through Last Month Reported Sep 1990	% Change
EMPLOYMENT (Thousands) - Avg.														
Oil & Gas Extraction (SIC13)	77.1	61.9	55.4	54.0	53.0	53.6	52.6	52.9	53.4	55.1	53.2	52.8	53.2	0.8%
Chemicals & Allied Products (SIC28)	28.0	26.1	25.3	26.8	28.2	28.3	28.5	28.6	28.9	28.9	29.0	28.2	28.7	1.8%
Petroleum Refining (SIC29)	11.1	11.5	11.5	10.3	10.6	10.7	10.6	10.7	10.9	10.9	10.9	10.6	10.7	0.9%
Total La. Employment	1744.2	1727.3	1726.7	1712.0	1745.9	1777.8	1705.4	1770.1	1826.0	1784.0	1767.1	1735.3	1756.0	1.2%
OIL PRICES ($/BBL) - Avg.														
LA Wellhead	27.22	15.29	17.98	15.18	18.40	19.14	20.57	16.54	16.85	25.11	31.46	18.15	20.53	13.1%
US Wellhead	24.09	12.45	15.42	12.55	15.87	16.52	17.75	13.71	14.02	21.85	28.44	15.65	17.63	12.7%
SPOT (Avg. End of Week)														
W. Texas Int. - Cushing	NC	14.47	18.80	15.96	19.58	20.33	21.72	17.99	17.38	27.17	33.69	19.34	21.93	13.4%
Louisiana - St. James	NC	14.56	19.52	16.12	19.72	20.77	21.54	17.61	18.81	27.88	35.17	19.36	22.14	14.4%
GAS PRICES ($/MCF)-Avg.														
LA Wellhead	2.34	1.83	1.62	1.67	1.73	1.90	1.84	1.54	1.68	NA	NA	1.68	NA	--
US Wellhead	2.51	1.94	1.66	1.73	1.69	1.72	1.89	1.44	1.50	1.54	1.59	1.68	1.66	-1.2%
COAL PRICES ($/Short Ton) (Avg.Elec.Util.Receipt Price)	37.06	29.21	26.81	25.75	26.61	26.99	27.87	27.65	27.59	27.59	27.59	26.58	27.70	4.2%
PRINCIPAL ENERGY RELATED REVENUES (Millions $)														
Sev. - Oil & Condensate	598.3	390.3	345.6	300.0	314.4	73.7	85.7	69.5	29.9	21.7	37.8	240.7	244.5	1.6%
Sev. - Natural Gas	121.1	126.1	112.7	106.4	109.4	23.8	28.2	24.9	11.4	11.3	13.1	85.6	89.0	4.0%
Bonuses	32.1	15.9	25.5	17.7	12.1	3.2	4.1	9.6	0.6	0.7	1.5	8.9	16.6	86.5%
Rentals	20.9	12.3	6.7	9.3	8.5	2.1	2.4	1.1	0.5	0.3	0.6	6.4	4.9	-23.4%
Royalties	379.1	304.5	253.8	243.2	275.8	56.0	58.5	61.3	18.5	20.5	16.7	219.8	175.5	-20.2%
Special Fuels Tax	52.3	57.6	55.2	58.0	58.5	14.5	15.4	18.9	7.2	6.0	5.8	44.0	53.2	20.9%
Gasoline Tax	286.2	289.5	311.6	314.7	208.0	72.6	86.2	90.8	33.5	32.5	37.0	235.4	280.0	18.9%
Nat. Gas Franchise Tax	11.0	10.9	9.3	9.7	9.0	1.9	1.9	3.6	1.0	0.4	0.1	7.0	6.8	-2.9%
Total Energy Revenues	1502.9	1211.6	1126.4	1062.8	1100.8	249.8	283.7	280.7	103.4	93.5	112.7	851.0	874.0	2.7%
TOTAL STATE REVENUES (Millions $)	4335.6	3913.2	3783.6	4181.8	4457.9	1058.9	1016.1	1410.6	365.5	351.5	411.6	3782.9	3555.2	-6.0%
ENERGY RELATED REVENUES AS % OF STATE TOTAL	34.7	31.0	29.8	25.4	24.7	23.6	27.9	19.9	28.3	26.6	27.4	22.5	24.6	9.3%

NA = Not available from source
NC = Not collected

D2730-1

Louisiana Energy Indicators

Center for Energy Studies

Louisiana State University

Fall 1990

THE HISTORY OF LOUISIANA'S GAS SEVERANCE TAX

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Louisiana Department of Revenue & Taxation

For the first time in 16 years, the LA legislature has increased the gas severance tax rate. At one time this tax was the leading revenue producer of all natural resources taxed in the state. But, in the last sixteen years, the volume of gas produced and the corresponding tax revenues have declined dramatically. The following is the history of Louisiana's gas severance tax--where it has been, and what we can expect to see in future years in Louisiana.

The first tax, based upon the severance of gas, occurred in 1910. This gas tax was levied as an occupational license tax at a rate of 1/5 cent per 10,000 cubic feet or 10 mcf. In 1912, the rate was changed to 1/2 percent of gross value of production less royalty interest. Continuing as an occupational license tax, the rate changed again in 1920 to 2 percent of gross value of production.

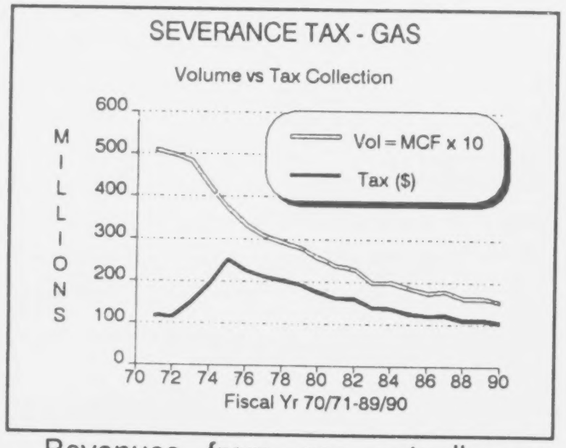
Act 140 of 1922 carried into effect a 1921 constitutional authority for a severance tax. The gas severance tax was 3 percent of gross market value of total production. The rate changed back to a volumetric tax of 1/5 cent per 1,000 cubic feet or mcf in 1928, and in 1936 to 3/10 cent or 3 mills per mcf.

This 3/10 cent or 3 mill rate continued until 1958; however, a gas gathering tax of 1/2 cent per mcf was instituted in 1940. The gas gathering tax doubled to 1 cent per mcf in 1948, and again to 2 cents per mcf in 1958. When the constitutionality of the gas gathering tax was questioned, a special session of the legislature suspended it and naturally raised the gas severance tax by a like 2 cents. The Louisiana Supreme Court did declare the gas gathering tax unconstitutional on November 9, 1959. The gas gathering tax peaked in fiscal year 1957-58, bringing in revenues of $18.7 million dollars.

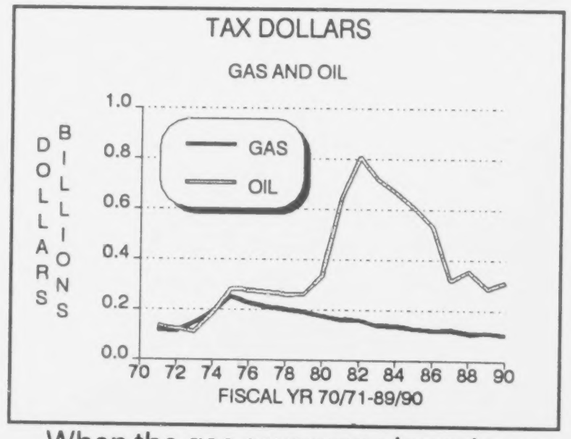
The next radical change occurred in August, 1972, when the gas severance tax rate changed to 11 1/2 percent of the value or 2.3 cents per mcf whichever was greater.

Although the actual statute was only a few sentences in length, six pages of rules and regulations were promulgated to administer this new change. The present problem of how to determine wellhead value, sales price less marketing costs, existed in 1972. This new value tax was deemed unworkable and was repealed after one month.

After repeal, a 43 percent increase was added to the volumetric tax raising it from 2.3 cents to 3.3. cents per mcf. The tax rate was increased again, effective January 1, 1974, more than doubling to 7 cents per mcf. The natural gas severance tax reached its peak in fiscal year 1974/75 with collections of $251 million and has since declined in proportion to the falling production.



Revenues from gas actually exceeded those of oil during fiscal years 1972/73 and 1973/74. However, with oil being a percentage of value versus the volumetric tax for gas, combined with the rapid escalation of oil prices leading up to decontrol, a vast discrepancy in two sources of revenue has occurred.

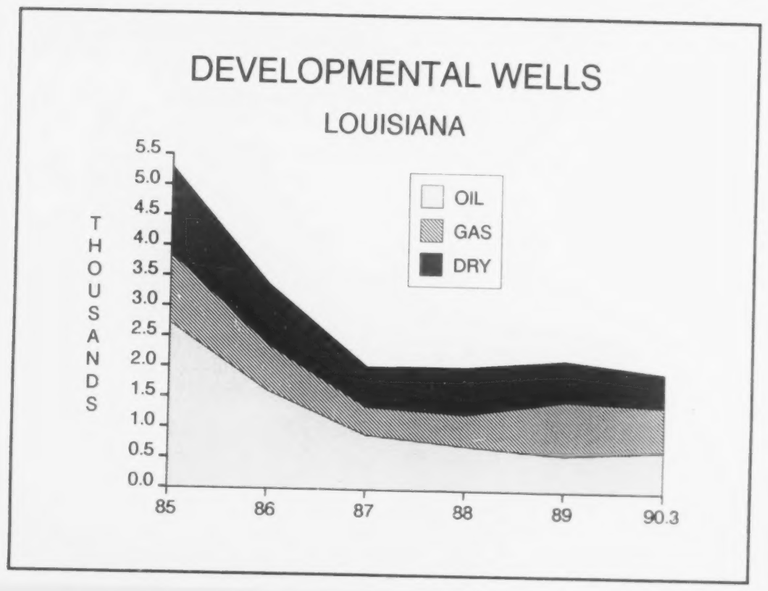


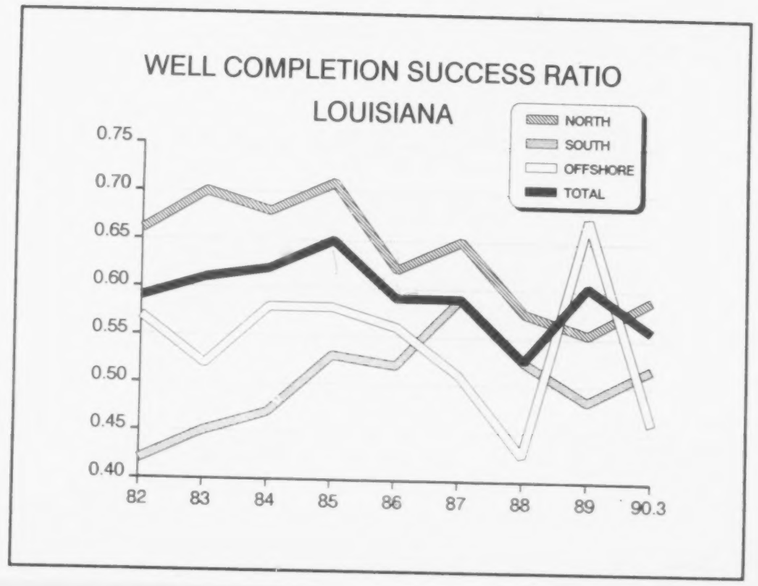
When the gas severance tax rate was increased to 7 cents in January of 1974, the 7 cent tax rate equated to 26 percent of value. Today, the 7 cent rate equals 4 percent of value so it was only logical to expect the Legislature to look in this area for additional revenues. Several methods of taxation were proposed, BTU content, indexing, and a percentage of value.

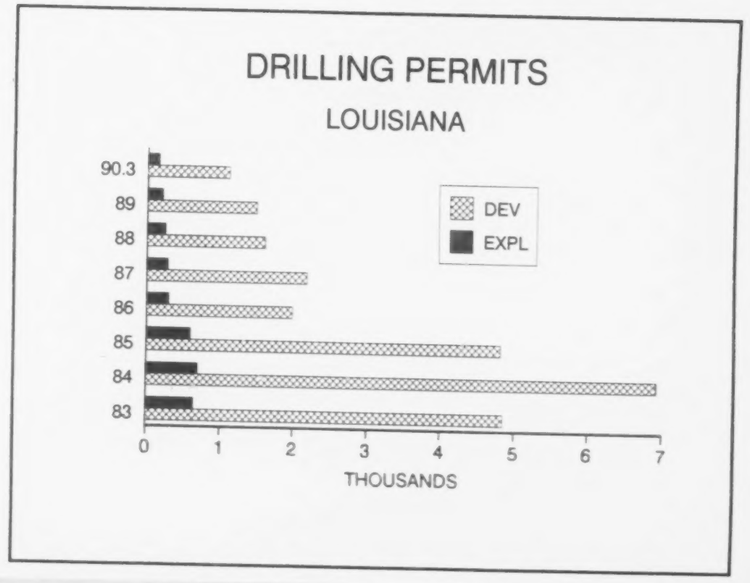
Act 387 of the 1990 Regular Session of the Louisiana Legislature changed the natural gas severance tax from the 7 cents per mcf rate to an index method

Continued on back page

Drilling







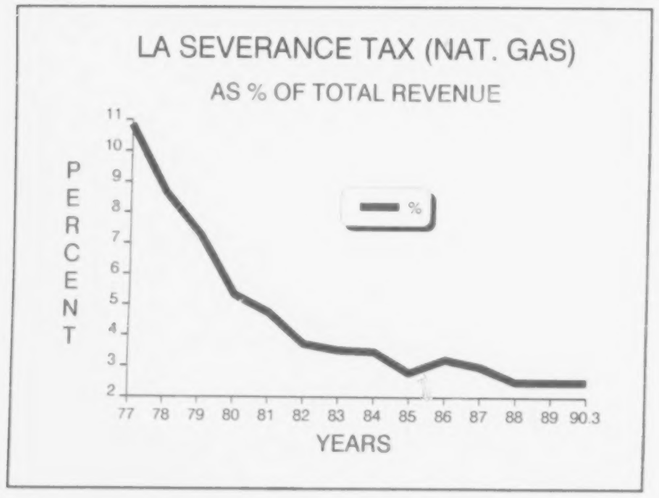
Figures represent TOTAL
except when otherwise noted

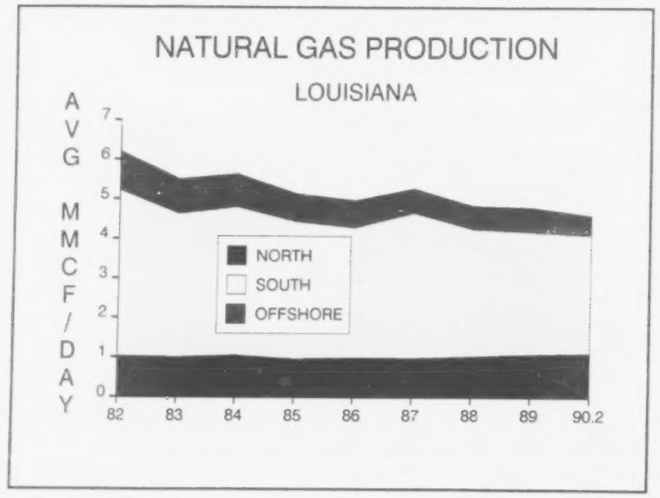
Totals may not add due to rounding

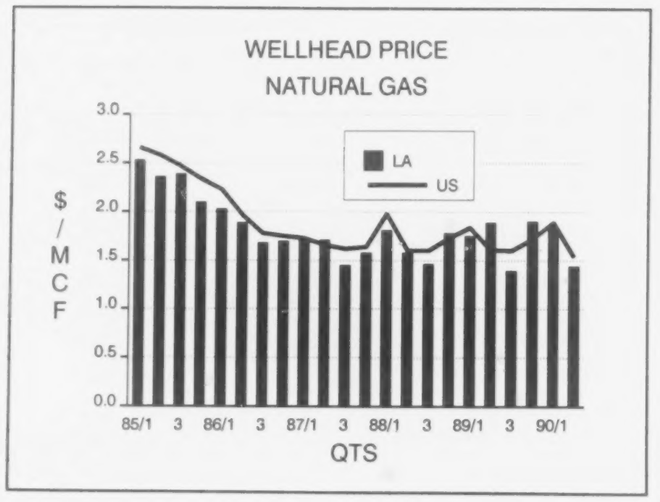
Indicator	1985	1986	1987	1988	1989	89.4	90.1	90.2	Jul	Aug	Sep	Year to Date Through Last Month Reported Sep 1989	Year to Date Through Last Month Reported Sep 1990	% Change
DEVELOPMENTAL WELLS - LA.* (As reported)														
Oil	2712	1604	901	736	605	134	493	87	15	44	50	471	689	46.3%
Gas	1145	768	462	518	889	309	523	106	21	36	50	580	736	26.9%
Dry	1433	1000	666	783	678	176	207	186	55	58	47	502	553	10.2%
Total	5290	3372	2029	2037	2172	619	1223	379	91	138	147	1553	1978	27.4%
WELL COMPLETIONS - LA.* (As reported)														
North	4038	2209	1106	1018	862	260	290	188	69	84	96	602	727	20.8%
South	1325	1036	740	689	505	119	166	95	25	41	31	386	358	-7.3%
Offshore	754	628	598	759	1194	334	884	188	24	35	53	860	1184	37.7%
Total	6117	3873	2444	2466	2561	713	1340	471	118	160	180	1848	2269	22.8%
WELL COMPLETION SUCCESS RATIO (As reported)														
North	0.705	0.621	0.646	0.576	0.554	0.538	0.684	0.632	0.333	0.488	0.552	0.560	0.591	5.5%
South	0.528	0.517	0.587	0.525	0.484	0.514	0.494	0.502	0.480	0.659	0.548	0.474	0.519	9.5%
Offshore	0.581	0.562	0.509	0.427	0.675	0.764	0.866	0.159	0.083	0.371	0.623	0.646	0.461	-28.6%
Total	0.651	0.589	0.591	0.526	0.604	0.640	0.785	0.423	0.314	0.506	0.572	0.592	0.558	-5.7%
DRILLING PERMITS ISSUED														
Exploratory	599	298	283	249	204	48	36	51	17	24	19	156	147	-5.8%
Developmental	4811	1983	2169	1601	1486	437	276	400	105	187	132	1049	1100	4.9%
Total	5410	2281	2452	1850	1690	485	312	451	122	211	151	1205	1526	26.6%
RUNNING RIGS (Avg. Hughes Tool)														
North	25	12	12	14	16	20	19	17	19	19	19	15	19	26.7%
South	129	63	59	62	52	58	57	56	55	56	50	50	56	12.0%
Offshore (Includes Fed. OCS)	129	69	65	88	72	77	74	80	78	76	75	70	77	10.0%
Total	283	144	136	164	140	155	149	153	152	150	144	135	150	11.1%

*Source: Petroleum Information Corporation. CES maintains additional data in the Indicators Database.

Historical Presentation - Natural Gas







Figures represent TOTAL
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Indicator	84.3	84.4	85.1	85.2	85.3	85.4	86.1	86.2	86.3	86.4	87.1	87.2
GAS PRICES ($/MCF)-Avg												
Wellhead												
LA	2.49	2.87	2.53	2.36	2.39	2.10	2.03	1.89	1.68	1.70	1.73	1.71
US	2.66	2.60	2.66	2.58	2.47	2.34	2.23	1.97	1.78	1.75	1.73	1.66
NATURAL GAS PRODUCTION												
Casinghead Included												
(Avg. BCF/day)												
North	1.1	1.0	1.0	0.9	1.0	1.0	1.0	0.9	0.9	1.0	1.0	1.0
South	3.7	3.6	3.8	3.5	3.2	3.4	3.5	3.3	3.3	3.1	3.4	3.2
Offshore	0.8	0.8	0.8	0.7	0.6	0.7	0.8	0.7	0.6	0.6	0.6	0.6
Total	5.6	5.4	5.5	5.1	4.8	5.1	5.4	5.0	4.9	4.7	5.0	4.7

Indicator	87.3	87.4	88.1	88.2	88.3	88.4	89.1	89.2	89.3	89.4	90.1	90.2
GAS PRICES ($/MCF)-Avg												
Wellhead												
LA	1.45	1.58	1.81	1.58	1.46	1.78	1.75	1.89	1.39	1.90	1.84	1.44
US	1.62	1.64	1.98	1.60	1.60	1.73	1.83	1.61	1.60	1.72	1.89	1.54
NATURAL GAS PRODUCTION												
Casinghead Included												
(Avg. MMCF/day)												
North	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1
South	3.1	3.2	3.2	3.2	3.2	3.3	3.2	3.1	3.0	3.0	3.1	3.0
Offshore	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5
Total	4.6	4.8	4.9	4.8	4.8	4.8	4.8	4.8	4.6	4.6	4.8	4.6

Continued from front

with a base rate of 10 cents per mcf. The effective date of this change is July 1, 1990 and will be adjusted (indexed) annually using the following formula:

$.10 x (Y/Z) = NEW TAX RATE

Where:
Y=LA gas spot market price for current 12 month period

Z=LA gas spot market price for prior 12 month period

The spot market prices shall be the price of gas fuels delivered into the pipelines in Louisiana as reported in the Natural Gas Clearing House. After 2 years, or on July 1, 1992, the tax rate will revert back to 7 cents per mcf and retain the index mechanism. It is assumed that the two years will be a trial period and alternative methods will again be considered should indexing fail to achieve the desired results.

HISTORY OF OIL, GAS AND GAS GATHERING RATES IN LOUISIANA

GAS:

1910	1/5 cent/10,000 cubic feet or 10 mcf
1912	1/2% gross value of production less royalty interest
1920	2% gross value of production
1922	3% gross market value
1928	1/5 cent/mcf
1936	**3/10 cent/mcf**
1958	**2.3 cents/mcf**
8/1972	2.3 cents/mcf or 11 1/2% of value
9/1972	3.3 cents/mcf
1/1974	7 cents/mcf
7/1990	10 cents/mcf

GAS GATHERING:

1940	1/2 cent/mcf
1948	1 cent/mcf
1958	2 cents/mcf

OIL:

1910	2/5 cent/barrel
1912	1/2% of gross value of production less royalty interest
1920	2% gross value of production
1922	3% gross market value
1928	4 - 11 cents/barrel depending on gravity
1940	6 - 11 cents/barrel depending on gravity
1948	18 - 26 cents/barrel depending on gravity
1/1974	12 1/2% of gross value

SOURCES OF INDICATOR DATA PUBLICATIONS

Consumer Price Index. U.S. Dept. of Labor. Bureau of Labor Statistics. Monthly.
Price Indexes.

Electric Power Monthly. U.S. Dept. of Energy. Energy Information Administration.
Electricity Production and Consumption Data

Employment and Total Wages Paid by Employers Subject to the Louisiana Employment Security Law. Louisiana Dept. of Labor. Office of Management and Finance Research and Statistics Unit. Quarterly.
Wages. Number of Establishments. Employment Data

Louisiana Climatological Data. U.S. Dept. of Commerce. National Weather Service. Monthly.
Heating and Cooling Degree Days (Not in this issue)

Louisiana Petroleum Activity Report. Monthly.
Drilling. Rig Activity. Oil and Gas Production. Refinery Runs and Stocks Data

Monthly Energy Review. U.S. Dept. of Energy. Energy Information Administration. Monthly.
Crude Oil Prices.

Monthly Motor Fuel Reported by States. U.S. Dept. of Transportation. Monthly.
Federal Highway Administration Gasoline Consumption - U.S.

Natural Gas Monthly. U.S. Dept. of Energy. Energy Information Administration.
Interstate Natural Gas Price Data
Wellhead Price of Natural Gas - U.S.
Production Data

Oil & Gas Journal. Penn Well Publishing Company. Tulsa, Oklahoma.
Gasoline Prices.

Petroleum Marketing Monthly. Dept. of Energy. Energy Information Administration. Office of Oil & Gas.
Wellhead Price of Crude Oil

Survey of Current Business. U.S. Dept. of Commerce. Bureau of Economic Analysis. Monthly.
Gross National Product
Consumer Price Index

World Oil. Gulf Publishing Company. Houston, Texas.
Wells Drilled; Wells Completed

OTHER SOURCES

Hughes Tool Company
Rig Activity

Louisiana Department of Natural Resources. Office of Conservation.

Louisiana Department of Revenue and Taxation. Statement of Net Collections and Distributions. (Mimeograph)
Taxes and Revenues

Louisiana Public Service Commission. (Mimeograph)
Electricity Data
Intrastate Natural Gas Prices

Petroleum Information Corporation (Unpublished data.)
Wells Completed
Wells Abandoned

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